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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of  
DISTEFANO et al.

Application No. 09/534,939

Filed: March 24, 2000

For: P-CONNECTION COMPONENTS  
WITH FRANGIBLE LEADS AND BUS

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:  
: Group Art Unit: 2827  
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: Examiner: D. Graybill  
:  
: Date: May 16, 2002  
:  
:  
X

BOX RCE  
Commissioner for Patents  
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to initiation of prosecution on the merits,  
please amend the above-identified patent application as  
follows:

IN THE ABSTRACT

Please delete the originally filed Abstract and  
substitute therefor the new Abstract attached hereto.

IN THE CLAIMS

CLEAN COPY OF AMENDED CLAIMS:

1. A semiconductor chip mounting component comprising:  
(a) a support structure having a top surface, bottom

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*Michael J. Doherty*  
(Signature)

MICHAEL J. DOHERTY

Typed or Printed Name of Person Signing Certificate

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C2 surface, and a gap extending through said support structure between said surfaces for defining first and second portions of said support structure;

(b) a plurality of electrically conductive leads, each said lead having a connection section extending across said gap, said connection section having a first end disposed on the support structure on one side of the gap, a second end secured to said support structure on an opposite side of said gap, and a frangible section;

(c) at least one elongated bus disposed alongside said gap, on one of said first and second portions of said support structure, wherein each of said leads extends across said gap and is connected to the bus and wherein said leads are adapted to be bonded to contacts on a semiconductor chip by braking the frangible sections of said leads so as to disconnect said leads from the bus.

C3 17. (Amended) A component as claimed in claim 1, wherein said support structure includes the first and second portions, said gap including a plurality of elongated slots extending substantially around said first portion so that the slots are disposed between the first portion and the second portion, the component including a plurality of said elongated buses arranged on said second portion so that one such bus extends alongside each said slot.

C4 18. (Twice Amended) The component as claimed in claim 17, wherein said buses are connected to one another so that said buses cooperatively form a structure on said second portion substantially surrounding said first portion and said slots.

19. (Twice Amended) The component as claimed in claim 18, wherein said slots are connected to one another to form substantially continuous channel surrounding said first

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portion, said first portion being connected to said second portion only through said leads, whereby said first portion will be detached from said second portion upon breakage of said frangible sections.

MARKED-UP COPY OF AMENDED CLAIMS:

1. A semiconductor chip mounting component comprising:
  - (a) a support structure having a top surface, bottom surface, and a gap extending through said support structure between said surfaces for defining first and second portions of said support structure;
  - (b) a plurality of electrically conductive leads, each said lead having a connection section extending across said gap, said connection section having a first end disposed on the support structure on one side of the gap, a second end secured to said support structure on an opposite side of said gap, and a frangible section;
  - (c) at least one elongated bus disposed alongside said gap, on one of said first and second portions of said support structure, wherein each of said leads extends across said gap and is connected to the bus and wherein said leads are adapted to be bonded to contacts on a semiconductor chip by braking the frangible sections of said leads so as to disconnect said leads from the bus.
17. (Amended) A component as claimed in claim 1, wherein said support structure includes ~~a central portion and a peripheral portion~~ the first and second portions, said gap including a plurality of elongated slots extending substantially around said ~~central~~ first portion so that the slots are disposed between the ~~central~~ first portion and the ~~peripheral~~ second portion, the component including a plurality of said elongated buses arranged on said ~~peripheral~~

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second portion so that one such bus extends alongside each said slot.

18. (Twice Amended) The component as claimed in claim 17, wherein said buses are connected to one another so that said buses cooperatively form a structure on said ~~peripheral~~ second portion substantially surrounding said ~~central~~ first portion and said slots.

19. (Twice Amended) The component as claimed in claim 18, wherein said slots are connected to one another to form substantially continuous channel surrounding said ~~central~~ first portion, said ~~central~~ first portion being connected to said ~~peripheral~~ second portion only through said leads, whereby said ~~central~~ first portion will be detached from said ~~peripheral~~ second portion upon breakage of said frangible sections.

REMARKS

This Preliminary Amendment is being filed simultaneously with a Request for Continued Examination (RCE). This Preliminary Amendment is responsive to the Final Office Action mailed August 10, 2001. Applicants filed a Notice of Appeal that was entered in the United States Patent and Trademark Office on March 4, 2002. Enclosed herewith is a Petition requesting a one-month extension of time for extending the deadline for responding to the Notice of Appeal from May 4, 2002 to and including June 4, 2002.

Applicants note that claim 1 has been amended to more clearly set forth the scope of the present invention. The amendment of claim 1 is fully supported by the specification and introduces no new matter. Claims 17-19 have been amended to correspond to the changes made to claim 1.

In the Final Office Action, the Examiner rejected claims 1-25 under 35 U.S.C. §112, second paragraph, as being indefinite, asserting that the term "frangible" used in claims 1, 6-7, 15-16, 19, and 22-25 is vague. In response, Applicants note that the term "frangible" is used to describe a portion of a lead in dozens of issued U.S. patents. For example, claim 1 of U.S. patent 6,274,822 discloses a method of making a semiconductor connection component including leads having "frangible" sections. Claim 11 of U.S. Patent 6,255,723 discloses a microelectronic lead element including a "frangible portion adjacent said bonding region." Claim 1 of U.S. Patent 6,218,213 discloses a method of making a "lead having a frangible intermediate section." In addition, the specification of the present application clearly defines the term "frangible." Beginning at page 44, line 21, the specification (FIG. 24) of the present application states:

The dimensions and configuration of the lead will vary somewhat depending upon the materials of construction and depending upon the desired application. Leads having connection sections and frangible sections formed principally or entirely from gold may be employed. For gold or other noble metal leads with relatively small spacing between leads, the width  $w_1$  or dimension between the opposed edges of the lead in the direction transverse to the length of the connection section may be between about 15 microns and about 38 microns. The second end securement section 1370 may have a similar width. The frangible section 1372 of each lead may be defined by a pair of notches extending inwardly from the opposed edges of the lead. Each such notch may have a pair of angularly arranged edges defining a generally V-shaped notch with an included angle A (Fig. 24) desirably between about 45 degrees and about 120 degrees. The width  $w_2$  of the frangible section in the notch, i.e., the smallest dimension of the neck or frangible section in the direction transverse to the length of the connection section may be between about 5 microns and about 12 microns. Most preferably, the leads, including the connection sections have a thickness or vertical extent perpendicular to the plane of the dielectric layer 1332 (perpendicular to the plane of the drawings in Figs. 23 and 24) of about 10 to about 30 microns and most desirably about 25 microns. Preferably, each bus 1353 has a width  $w_3$ , i.e., the dimension transverse to the length of the bus, of at least about 50 microns and more preferably between about 50 and about 200 microns and a thickness of about 10 to about 30 microns and more preferably about 25 microns.

Thus, the specification provides a clear standard for ascertaining the meaning of the term "frangible," and one of ordinary skill in the art would be reasonably apprised of the scope of the invention as required by MPEP 706.03(d). Finally, Applicants respectfully note that the present application is a continuation of commonly assigned U.S. Patent 6,054,756, and that the Examiner of the present application

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allowed the '756 patent without objecting to the term "frangible" in claims 1-3 and 9 thereof. For all of the above reasons, Applicants respectfully assert that claims 1, 6-7, 15-16, 19 and 22-25 satisfy the requirements of 35 U.S.C. § 112, second paragraph, and respectfully request that the Examiner's rejection be withdrawn.

In the Final Office Action, the Examiner rejected claims 1, 4-16 and 20-22 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 4,380,042 to *Angelucci*, asserting that *Angelucci's* connecting frame 32 (FIGS. 3 and 4) teaches Applicants' "bus bar." Clearly, *Angelucci's* connecting frame 32 is not located on the tape 20, but is attached to the semiconductor chip 28. As noted above, Applicants have amended claim 1 to more clearly define the scope of the present invention. Amended claim 1 is unanticipated by *Angelucci* because the cited reference neither discloses nor suggests a semiconductor chip mounting component including "at least one elongated bus bar disposed alongside said gap on one of said first and second portions of said support structure, wherein each of said leads extends across said gap and is connected to the bus, and wherein said leads are adapted to be bonded to contacts on a semiconductor chip by breaking the frangible sections of said leads so as to disconnect said leads from the bus." Thus, claim 1 is unanticipated by *Angelucci* and is otherwise allowable. Claims 4-16 and 20-22 are also unanticipated, inter alia, by virtue of their dependence from claim 1, which is unanticipated for the reasons set forth above.

In the Final Office Action, the Examiner rejected claims 1, 17-21 and 25 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 4,801,999 to *Hayward*. A review of *Hayward* indicates that it does not teach or even suggest that

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its leads have a frangible section. As is well known, for "a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed invention must be identically shown in a single reference." *In re Bond*, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). Thus, claim 1 cannot be anticipated by *Hayward* because the cited reference neither discloses nor suggests a semiconductor chip mounting component including "a plurality of electrically conductive leads, each said lead having . . . a frangible section between the first and second ends." *Hayward* simply does not teach or suggest the "frangible section" required by the limitations recited in claim 1. *Hayward* also does not disclose that the "leads are adapted to be bonded to contacts on a semiconductor chip by breaking the frangible sections of said leads so as to disconnect said leads from the bus." For all of these reasons, claim 1 is unanticipated by *Hayward* and is otherwise allowable. Claims 17-21 and 25 are also unanticipated, *inter alia*, by virtue of their dependence from claim 1, which is unanticipated for the reasons set forth above.

In the Final Office Action, the Examiner rejected claims 1-3, 20-21 and 25 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 5,459,634 to *Nelson*. In response, Applicants respectfully assert that *Nelson* does not teach leads "adapted to be bonded to contacts on a semiconductor chip by breaking the frangible sections of said leads so as to disconnect said leads from the bus." *Nelson's* leads do not include a "frangible section", nor is any frangible section contemplated in *Nelson*. Thus, claim 1 is unanticipated by *Nelson* and is otherwise allowable. Claims 2-3, 20-21 and 25 are also unanticipated, *inter alia*, by virtue of their dependence from claim 1, which is unanticipated for the reasons set forth above.



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In the Final Office Action, the Examiner rejected claims 1 and 20-25 under 35 U.S.C. § 103(a) as being unpatentable over the combination of U.S. Patent 5,550,406 to *McCormick* and U.S. Patent 5,459,634 to *Nelson*. Claim 1 is unobvious over the combination of *McCormick* and *Nelson* because the cited references neither disclose nor suggest a plurality of electrically conductive leads, "wherein each of said leads extends across said gap and is connected to the bus, and wherein said leads are adapted to be bonded to contacts on a semiconductor chip by breaking the frangible sections of said leads so as to disconnect said leads from the bus. Specifically, at col. 12, lines 47-52 thereof, *McCormick* describes its leads being "broken and bent downward past the polyamide layer 320 to contact a second conductive plane." (See FIG. 3A.) *McCormick*, however, provides no teaching or suggestion that the leads include a "frangible section" as disclosed in Applicants' specification and shown in Applicants' FIG. 24, or that the "frangible section" is broken for disconnecting the lead from the bus bar. For all of these reasons, claim 1 is unobvious over *McCormick* and *Nelson* and is otherwise allowable. Claims 20-25 are also unobvious, *inter alia*, by virtue of their dependence from claim 1, which is unobvious for the reasons set forth above.

As it is believed that all of the rejections, objections and requirements set forth in the Final Office Action have been fully met, favorable reconsideration and allowance are earnestly solicited.

Applicants attorneys respectfully request that the Examiner contact the undersigned to schedule a telephone interview of the present application.

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If there are any additional charges in connection with this requested Preliminary Amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

Respectfully submitted,

LERNER, DAVID, LITTENBERG,  
KRUMHOLZ & MENTLIK LLP

A handwritten signature in black ink, appearing to read "Michael J. Doherty", is written over the printed name.

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